

III. REMARKS

Claims 1-26 are pending in this application. In the Office Action, claims 1-26 are rejected and claims 5, 17, and 25 are objected to. By this Amendment, claims 2, 5, 8, 9, 17, 23, and 25 are amended. Reconsideration in view of the above amendments and the following remarks is respectfully requested. Applicant does not acquiesce in the correctness of the rejections or objections and reserves the right to present specific arguments regarding any rejected or objected-to claims not specifically addressed. Further, Applicant reserves the right to pursue the full scope of the subject matter of the claims in a subsequent patent application that claims priority to the instant application.

In the Office Action, claims 5, 17, and 25 are each objected to. Claim 5 is amended to correct a typographical error. Claim 17 is amended to more clearly distinguish between a "free portion" and a "free end" of the leaf seal member. Claim 25 is amended to more clearly define the subject matter of the claim. Specifically, claim 25 is amended to more clearly claim a support for use with a leaf seal, *i.e.*, a leaf seal is not being claimed in combination with the support.

Claim 2 has been amended to correct a grammatical error.

In addition, claims 8, 9, and 23 have been amended to more clearly identify the claimed subject matter. Specifically, each claim has been amended to more clearly recite that the free portion is angled out of plane relative to the fixed portion. Support for these amendments can be found in FIGS. 21A-21C and 24A as well as paragraphs 071-072. No new material is believed added.

In the Office Action, claims 1, 8, 19, 21, and 23-25 are rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,987,879 to Ono. This rejection is respectfully

traversed. Applicant asserts that the Office is misinterpreting numerous aspects of the Ono reference and/or the claimed invention. First, Applicant asserts that the Ono reference fails to teach a support "coupled to the leaf seal for supporting the free portion," as recited in each of claims 1 and 19. In the Office Action, the Office asserts that Ono discloses "leaf seal (3, 4) with a fixed portion (portion received by 5)" and that the guide provides a support. Office Action, page 3. However, Ono states "the inner spring seal 4 and the outer spring seal 3 slide in a space a of the spring seal guide 5." Column 3, lines 13-20. Because spring seals 3, 4 slide relative to guide 5, they are not coupled to it. In contrast, the fixed end in Ono is the end of spring seals 3, 4 opposite guide 5. "The other end portion of the spring seal [3, 4] which is opposite to that pinched between the spring seal guide [5] and the outer wall of the inner tube [1] or between the spring seal guide [5] and the inner wall of the tail tube [2] is fixed to the inner wall of the tail tube [2] or to the outer wall of the inner tube [1] by an appropriate fixing means." Col. 2, lines 7-12 (reference numerals added). Therefore, Applicant submits that Ono fails to disclose a support "coupled to the leaf seal for supporting the free portion," as recited in each of claims 1 and 19. For the same reason, the Ono reference fails to teach "coupling the leaf seal to a support," as recited in claim 24.

Second, Applicant asserts that the Ono reference fails to teach a "leaf seal including a fixed portion that is angled relative to a free portion thereof" as recited in each of claims 1, 19, and 24. Specifically, Applicant disagrees with the Office's conclusion regarding the fixed portion being angled relative to the free portion because the fixed and free portions are actually parallel in Ono. See FIG. 4. This is the case even though, assuming *arguendo*, that the portion of spring seal 3, 4 in FIG. 4 fixed to tail tube 2 is a "fixed portion" and the portion of spring seal 3, 4 received by guide 5 is a "free portion," The FIG. 1 embodiment of Ono does not disclose a different situation. In view of the foregoing, Applicant submits that Ono does not disclose a leaf

seal including "a fixed portion that is angled relative to a free portion thereof," as recited in each of claims 1, 19, and 24.

Third, Applicant submits that the Ono reference fails to disclose "a support...having a support portion...wherein the free portion contacts a distal end of the support portion," as recited in each of claims 1, 19, and 24. Despite the Office's assertion that "[t]he free portion contacts a distal end of the support portion (5) in an operative state," Applicant fails to discern any disclosure in Ono to that effect. In particular, spring seals 3, 4 appear to contact guide 5 at an intermediate portion. There is no disclosure that spring seals 3, 4 deform sufficiently to be supported by an end of guide 5. Clarification is respectfully requested.

Fourth, Applicant asserts that the Ono reference fails to teach a "rotatable component" as recited in claim 19. Rather, the Ono device is useful only as a static seal. That is, inner tube 1 and tail tube 2 are stationary parts of a combustor and are effectively joined in a fixed orientation. Ono states: "the present invention provides a spring seal device for a combustor of a gas turbine etc. which is constructed to comprise a spring seal guide which pinches an end portion of a spring seal between itself and an outer wall of an inner tube of the combustor or between itself and an inner wall of a tail tube of the combustor to connect said inner tube and said tail tube." Column 1, line 65 – column 2, line 6 (emphasis added). As such, any rotation of either inner tube 1 or tail tube 2 would result in frictional heating and likely the failure of the device.

Finally, the Ono reference fails to teach a support including "a mount portion for mounting the fixed portion," as recited in claim 25. As FIG. 4 of the Ono reference makes clear, guide 5 contacts, at most, only one portion of each spring seal 3, 4. Specifically, guide 5 contacts only a free portion of each spring seal 3, 4, the fixed portion of each spring seal being attached to tail tube 2. In the embodiment depicted in FIG. 1 of the Ono reference, the position

is switched such that the fixed portion of each spring seal is attached to inner tube 1 and guide 5 is attached to tail tube 2, but guide 5 still only contacts a free portion of the spring seal. In neither embodiment, however, does guide 5 provide "a mount portion for mounting the fixed portion."

In view of the foregoing, Applicant respectfully requests withdrawal of the rejection.

In the Office Action, claims 1, 3-5, 19, 21, 22, and 25 are rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 6,173,958 to Dinc *et al.* This rejection is traversed. First, Applicant respectfully asserts that the Office has mischaracterized the Dinc *et al.* device. Specifically, the Dinc *et al.* labyrinth seal utilizes bristle seals rather than leaf seals. Dinc *et al.* state:

- "Referring now to FIG. 4, there is illustrated another form of seal hereof wherein multiple layers 36 of woven materials are interspersed with free bristles 38. That is, a plurality of free bristles 38 are disposed between each adjacent pairs of woven material layers 36 in order to combine the advantages of both brush seals formed by free bristles and woven seals." Column 5, lines 48-53.
- "Referring now to FIG. 6, there is illustrated a cloth brush seal, generally designated 50, and specifically configured to seal the liner 52 of a combustor and a transition piece 54. In this form, the seal includes a pack of long woven metal/polymer/ceramic cloth strips comprising stiff brush bristle fibers 56 extending from a strip of woven fibers." Column 6, lines 11-16 (emphasis added).
- "In the seal of FIGS. 9 and 10, the brush bristles or the bristles extending from the weave are held in a frame 70 and project radially inwardly such that the tips of the bristles contact the shaft 72." Column 6, line 66 – column 7, line 3 (emphasis added).

Contrarily, the leaf seals of the present invention are elongate in cross-section and distinct from the circular cross-sections of "bristles" or "fibers." The present application supports this with the drawings and the following statements:

- "Attention is also given to the selection of seal member length L, along with thickness T...In such a design, seal members 324 promptly respond to reduced differential pressure and elastically spring from support portion 348 of support 338 toward their original shape and approximate cold clearance." Paragraph 074.
- See also, FIG. 20B, depicting stacked leaf members with narrower intervening spaces.

Applicant has, therefore, clearly distinguished Applicant's leaf seal from the brush seals and bristle seals known in the art, including those of the Dinc *et al.* reference. Thus, the Dinc *et al.* reference fails to teach "a leaf seal including a plurality of staggered leaf seal members," as recited in each of claims 1 and 19. Accordingly, Applicant respectfully requests withdrawal of the rejection.

In the Office Action, claims 2, 20, and 26 are rejected under 35 U.S.C. § 103(a) as being unpatentable over the Ono reference in view of U.S. Patent No. 4,813,608 to Holowach *et al.* This rejection is respectfully traversed. As explained above, the Ono reference fails to teach either a support "coupled to the leaf seal for supporting the free portion" or a "leaf seal including a fixed portion that is angled relative to a free portion thereof," as recited in each of claims 1, 19, and 26. The teachings of the Holowach *et al.* reference fail to remedy this deficiency. Accordingly, Applicant respectfully requests withdrawal of the rejection.

In the Office Action, claims 6 and 7 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Ono in view of U.S. Patent No. 5,108,116 to Johnson *et al.* This rejection is respectfully traversed. As explained above, the Ono reference fails to teach a support "coupled to the leaf seal for supporting the free portion," as recited in claim 1. The teachings of the

Johnson *et al.* reference fail to remedy this deficiency. Accordingly, Applicant respectfully requests withdrawal of the rejection.

In the Office Action, claims 8-17, 23, and 24 are rejected under 35 U.S.C. § 103(a) as being unpatentable over the Dinc *et al.* reference in view of U.S. Patent No. 4,720,969 to Jackman. Specifically, with respect to claims 8, 9, and 23, the Office asserts that the Jackman reference teaches a free portion angled out of plane relative to a fixed portion in an inoperative state. This rejection is traversed. Applicant asserts that the teachings of the Jackman reference are inapplicable to the Dinc *et al.* reference. Specifically, Applicant notes that the leaf spring seal 106 of the Jackman device is fixedly attached at each end. The Jackman reference states: "[a] primary leaf spring seal 106, FIG. 3, is rigidly attached to the lower surface of the platform 92 along the edge of the latter adjacent inner exhaust gas passage 24 and engages top surface 20 on the cross arm 18." Column 5, lines 4-7. As such, the alleged "free portion" of the Jackman reference is, in fact, immobile, and cannot be "free." Accordingly, any attempt to apply the "free portion" of the Jackman reference to the Dinc *et al.* device would necessarily preclude a free portion that "slidably engages to seal the component to be sealed against," as recited in each of claims 8, 9, and 23.

In addition, Applicant respectfully asserts that the Jackman reference is non-analogous art. "In order to rely on a reference as a basis for rejection of an applicant's invention, the reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the inventor was concerned." *In re Oetiker*, 977 F.2d 1443, 1446, 24 USPQ2d 1443, 1445 (Fed. Cir. 1992); MPEP 2141.01(a). The device and method of the present invention relate to leaf seals for sealing against rotary components. The Jackman reference discloses a regenerator cross arm seal assembly for separating low pressure hot exhaust and high pressure air passages in a gas turbine engine block. As such, the Jackman

reference is clearly not in the field of Applicant's endeavor. In addition, the problem to be solved by the present invention is the sealing of arcuate, rotating surfaces. The Jackman device seals a space between flat, parallel, non-moving surfaces. As such, the Jackman device cannot reasonably be viewed as pertinent to the problem solved by the present invention. Applicant also notes the difference in classifications as evidence of the non-analogousness of the Jackman reference as prior art. See MPEP 2141.01(a). Accordingly, for each of the reasons given above, Applicant respectfully requests withdrawal of the rejection.

In the Office Action, claims 2, 20, and 26 are rejected under 35 U.S.C. § 103(a) as being unpatentable over the Dinc *et al.* reference in view of the Holowach *et al.* reference. For each of the reasons given above with respect to the Dinc *et al.* reference, each of which remains in view of the Holowach *et al.* reference, Applicant respectfully requests withdrawal of the rejection.


In the Office Action, claim 18 is rejected under 35 U.S.C. § 103(a) as being unpatentable over the Dinc *et al.* reference in view of the Jackman reference as applied to claim 9, and further in view of the Holowach *et al.* reference. For each of the reasons given above with respect to the Dinc *et al.* reference alone as well as its combination with the Jackman reference, each of which remains in view of the Holowach *et al.* reference, Applicant respectfully requests withdrawal of the rejection.

In the Office Action, claims 6 and 7 are rejected under 35 U.S.C. § 103(a) as being unpatentable over the Dinc *et al.* reference in view of the Johnson *et al.* reference. For each of the reasons given above with respect to the Dinc *et al.* reference, each of which remains in view of the Johnson *et al.* reference, Applicant respectfully requests withdrawal of the rejection.

In view of the foregoing, Applicant respectfully requests withdrawal of the rejections, and allowance of the application. Should the Examiner require anything further from Applicant,

the Examiner is invited to contact Applicant's undersigned representative at the number listed below.

Respectfully submitted,



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